

RECOIL NUCLEI OF ^{186}Re FOR USE IN THE MEDICAL PURPOSES

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The isotope of ^{186}Re is widely used (glass-based TheraSphere, Nordion, Canada and resin-based SIR-Spheres, Australia) for transarterial radioembolism in hepatocellular carcinoma (second in the world in total mortality). The average β -radiation energy of ^{186}Re 1.07 MeV is one of the highest among the radionuclides used in palliative therapy.

The powder of rhenium activated by bremsstrahlung at the Linac of the NSC KIPT. The photonuclear reaction $^{187}\text{Re}(\beta,n)^{186}\text{Re}$ was used. After activation, the powder was dissolved in HCl and, according to one of the methods, was homogenized with clinoptilolite particles ($20\text{--}40\ \mu\text{m}$), which were previously treated with hexadecyltrimethylammonium chloride to more efficiently sorption rhenium. The resulting mixture modified thermally. According to the second method, after the activated powder was dissolved in the HCl solution, electrolysis was carried out at pH=1.5, followed by isolation of $^{186}\text{ReO}_2$ at the cathode in the form of clinoptilolite particles [1].

The proposed methods for obtaining the isotope ^{186}Re can significantly reduce the cost of the procedure of radionuclide therapy in comparison with the used commercial agents.

[1.] E. Salakhova, V. Majidzade, F. Novruzova et al. The Electrodeposition of Rhenium in Alkaline and Acidic Electrolytes // J. Chem. Chem. Eng. –2012. –v.6 –p.489-494.

Primary author: Mr DIKIY., Mikola (Head of department)

Co-authors: Mr KRASNOSELSKY, Mikola (Director Institute of Radiology); Mr LYASHKO, Yuriy (scientist); Mrs MEDVEDEVA, Elena (scientist); Mr MEDVEDEV, Dmitriy (scientist); Mr UVAROV, Vacheslav (Doctor of science); Mr FEDORETS, Ivan (Head department)

Presenter: Mr DIKIY., Mikola (Head of department)

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